WHAT IS CLAIMED IS:

1. An electro-active device, said electro-active device comprising,

a) a substrate;

b) a first electrode disposed on a surface of said substrate;

c) a second electrode;

d) at least one electro-active layer disposed between said first electrode and said second electrode, wherein said at least one active layer comprises one of a light absorbing layer and a light emitting layer;

e) a first metal-containing layer disposed between said electro-active layer and one of said first electrode and said second electrode; wherein said first metal-containing layer comprises at least one metal disposed in a plurality of domains, and wherein at least one of said first electrode and said second electrode is a transparent electrode.

2. The electro-active device according to Claim 1, wherein said first metal-containing layer is disposed between said active layer and said transparent electrode and is transparent to light.

3. The electro-active device according to Claim 1, wherein said first metal-containing layer is transparent to light having a wavelength in a range from about 300 nm to about 10 microns.

4. The electro-active device according to Claim 1, wherein said first metal-containing layer and said transparent electrode are transparent to at least one of ultraviolet, infrared, near infrared, and visible light.

5. The electro-active device according to Claim 1, wherein said first metal-containing layer has a transparency to light of at least 80%.

6. The electro-active device according to Claim 1, wherein said at least one metal comprises at least one transition metal.

7. The electro-active device according to Claim 6, wherein said at least one transition metal is one of platinum, palladium, gold, silver, ruthenium, osmium, iridium, rhodium, copper, nickel, aluminum, and combinations thereof.

8. The electro-active device according to Claim 7, wherein said at least one transition metal is one of platinum, gold, and combinations thereof.

9. The electro-active device according to Claim 1, wherein each of said plurality of domains has a mean diameter of less than the wavelength of ultraviolet light.

10. The electro-active device according to Claim 1, wherein each of said plurality of domains has a mean diameter of less than the wavelength of visible light.

11. The electro-active device according to Claim 1, wherein each of said plurality of domains has a mean diameter of less than the wavelength of near infrared radiation.

12. The electro-active device according to Claim 1, wherein said plurality of domains has a mean diameter of less than the wavelength of infrared radiation.

13. The electro-active device according to Claim 1, wherein said plurality of domains forms a discontinuous layer on a surface of at least one of said first electrode and said second electrode.

14. The electro-active device according to Claim 13, wherein said discontinuous layer covers at least one percent of said surface.

15. The electro-active device according to Claim 1, wherein said plurality of domains forms a substantially continuous layer on a surface of at least one of said first electrode and said second electrode.

16. The electro-active device according to Claim 15, wherein said substantially continuous layer has a thickness in a range from about 0.5 nm to about 100 nm.

17. The electro-active device according to Claim 1, wherein at least one of said first metal-containing layer and second metal-containing layer comprises less than a monolayer of said at least one metal on a surface of at least one of said first electrode and said second electrode.

18. The electro-active device according to Claim 1, wherein said first metal-containing layer effects a change of at least 0.1 eV in a work function of a surface of at least one of said first electrode and said second electrode.

19. The electro-active device according to Claim 1, wherein said electro-active device is a photovoltaic cell.

20. The electro-active device according to Claim 1, wherein said electro-active device is an organic light emitting diode.

21. The electro-active device according to Claim 1, wherein said substrate is a glass substrate.

22. The electro-active device according to Claim 1, wherein said substrate is a polymeric substrate.

23. The electro-active device according to Claim 22, wherein said polymeric substrate comprises at least one of a polycarbonate, a polyolefin, a polyester, a polyimide, a polysulfone, an acrylate, and combinations thereof.

24. The electro-active device according to Claim 1, wherein said transparent electrode comprises at least one of a metal oxide, a metal, and combinations thereof.

25. The electro-active device according to Claim 24, wherein said metal oxide is one of indium oxide, tin oxide, indium tin oxide, zinc oxide, indium zinc

oxide, gallium indium tin oxide, zinc indium tin oxide, antimony oxide, and combinations thereof.

26. The electro-active device according to Claim 25, wherein said metal oxide further comprises at least one dopant, wherein said at least one dopant is gallium, zinc, and combinations thereof.

27. The electro-active device according to Claim 24, wherein said metal is one of gold, silver, aluminum, and combinations thereof.

28. The electro-active device according to Claim 1, further comprising a second metal-containing layer disposed between said least one active layer and one of said first electrode and said second electrode.

29. A metal-containing layer for an electro-active device, said metal-containing layer comprising at least one metal disposed in a plurality of domains, wherein said plurality of domains form a layer on a surface of a substrate, and wherein said plurality of domains are formed by decomposing a organometallic complex on a substrate and decomposing said organometallic complex at a temperature of less than about 200°C.

30. The metal-containing layer according to 29, wherein said metal-containing layer is transparent to light.

31. The metal-containing layer according to 29, wherein said metal-containing layer is transparent to light having a wavelength in a range from about 300 nm to about 10 microns.

32. The metal-containing layer according to 29, wherein said metal-containing layer is transparent to at least one of infrared, near infrared, and visible light.

33. The metal-containing layer according to Claim 29, wherein said metal-containing layer has a transparency to light of at least 80%.

34. The metal-containing layer according to Claim 29, wherein said at least one metal comprises at least one transition metal.

35. The metal-containing layer according to Claim 34, wherein said at least one transition metal is one of platinum, palladium, gold, silver, ruthenium, osmium, iridium, rhodium, copper, nickel, aluminum, and combinations thereof.

36. The metal-containing layer according to Claim 35, wherein said at least one transition metal is at least one of platinum, gold, and combinations thereof.

37. The metal-containing layer according to Claim 29, wherein each of said plurality of domains has a mean diameter of less than the wavelength of ultraviolet light.

38. The metal-containing layer device according to Claim 29, wherein said plurality of domains has a mean diameter of less than the wavelength of visible light.

39. The metal-containing layer according to Claim 29, wherein said plurality of domains has a mean diameter of less than the wavelength of near infrared radiation.

40. The metal-containing layer according to Claim 29, wherein said plurality of domains has a mean diameter of less than the wavelength of infrared radiation.

41. The metal-containing layer according to Claim 29, wherein each of said plurality of domains has a mean diameter of less than about 200 nm.

42. The metal-containing layer according to Claim 29, wherein said metal-containing layer comprises less than a monolayer of said at least one conductive metal disposed on said surface.

43. The metal-containing layer according to Claim 29, wherein said plurality of domains forms a discontinuous layer on said surface.

44. The metal-containing layer according to Claim 43, wherein said discontinuous layer covers at least one percent of said surface.

45. The metal-containing layer according to Claim 29, wherein said plurality of domains forms a substantially continuous layer on said surface.

46. The metal-containing layer according to Claim 45, wherein said substantially continuous layer has a thickness in a range from about 0.5 nm to about 100 nm.

47. The metal-containing layer according to Claim 29, wherein said metal-containing layer comprises less than a monolayer of said at least one metal on said surface.

48. The metal-containing layer according to Claim 29, wherein said metal-containing layer effects a change of at least 0.1 eV in a work function of said surface.

49. The metal-containing layer according to Claim 29, wherein said organometallic complex is decomposed by heating said organometallic complex to a temperature of less than about 200°C.

50. The metal-containing layer according to Claim 29, wherein said organometallic complex is decomposed by irradiating said organometallic complex at a temperature of less than about 200°C.

51. An electro-active device, said electro-active device comprising,

a) a substrate;

b) a first electrode disposed on a surface of said substrate;

c) a second electrode;

d) at least one electro-active layer disposed between said first electrode and said second electrode, wherein said at least one active layer comprises one of a light absorbing layer and a light emitting layer;

e) a first metal-containing layer disposed between said electro-active layer and one of said first electrode and said second electrode, wherein said first metal-containing layer comprises at least one metal disposed in a plurality of domains, wherein at least one of said first electrode and said second electrode is a transparent electrode, and wherein said first metal-containing layer is disposed between said active layer and said transparent electrode and is transparent to light.

52. The electro-active device according to Claim 51, wherein said first metal-containing layer has a transparency to visible light of at least 80%.

53. The electro-active device according to Claim 51, wherein said first metal-containing layer is transparent to light having a wavelength in a range from about 300 nm to about 10 microns.

54. The electro-active device according to Claim 51, wherein said first metal-containing layer and said transparent electrode are transparent to at least one of infrared, near infrared, and visible light.

55. The electro-active device according to Claim 51, wherein said first metal-containing layer has a transparency to light of at least 80%.

56. The electro-active device according to Claim 51, wherein said at least one metal comprises at least one transition metal.

57. The electro-active device according to Claim 56, wherein said at least one transition metal is one of platinum, palladium, gold, silver, ruthenium, osmium, iridium, rhodium, copper, nickel, aluminum, and combinations thereof.

58. The electro-active device according to Claim 57, wherein said at least one transition metal is at least one of platinum, gold, and combinations thereof.

59. The electro-active device according to Claim 51, wherein said plurality of domains has a mean diameter of less than the wavelength of ultraviolet light.

60. The electro-active device according to Claim 51, wherein said plurality of domains has a mean diameter of less than the wavelength of visible light.

61. The electro-active device according to Claim 51, wherein said plurality of domains has a mean diameter of less than the wavelength of near infrared radiation.

62. The electro-active device according to Claim 51, wherein said plurality of domains has a mean diameter of less than the wavelength of infrared radiation.

63. The electro-active device according to Claim 51, wherein said plurality of domains form a discontinuous layer on a surface of at least one of said first electrode and said second electrode.

64. The electro-active device according to Claim 51, wherein said plurality of domains forms a discontinuous layer on a surface of at least one of said first electrode and said second electrode.

65. The electro-active device according to Claim 64, wherein said discontinuous layer covers at least one percent of said surface.

66. The electro-active device according to Claim 51, wherein said plurality of domains forms a substantially continuous layer on a surface of at least one of said first electrode and said second electrode.

67. The electro-active device according to Claim 66, wherein said substantially continuous layer has a thickness in a range from about 0.5 nm to about 100 nm.

68. The electro-active device according to Claim 51, wherein said first metal-containing layer comprises less than a monolayer of said at least one metal on a surface of at least one of said first electrode and said second electrode.

69. The electro-active device according to Claim 51, wherein at least one of said first metal-containing layer and said second metal-containing layer effects a change of at least 0.1 eV in a work function of a surface of at least one of said first electrode and said second electrode.

70. The electro-active device according to Claim 51, wherein said electro-active device is a photovoltaic cell.

71. The electro-active device according to Claim 51, wherein said electro-active device is an organic light emitting diode.

72. The electro-active device according to Claim 51, wherein said substrate is a glass substrate.

73. The electro-active device according to Claim 51, wherein said substrate is a polymeric substrate.

74. The electro-active device according to Claim 73, wherein said polymeric substrate comprises at least one of a polycarbonate, a polyolefin, a polyester, a polyimide, a polysulfone, an acrylate, and combinations thereof.

75. The electro-active device according to Claim 51, wherein said transparent electrode comprises at least one of a metal oxide, a metal, and combinations thereof.

76. The electro-active device according to Claim 75, wherein said metal oxide is one of indium oxide, tin oxide, indium tin oxide, zinc oxide, indium zinc oxide, gallium indium tin oxide, zinc indium tin oxide, antimony oxide, and combinations thereof.

77. The electro-active device according to Claim 76, wherein said metal oxide further comprises wherein said metal oxide further comprises at least one dopant, wherein said at least one dopant is one of gallium, zinc, and combinations thereof.

78. The electro-active device according to Claim 75, wherein said metal is one of gold, silver, aluminum, and combinations thereof.

79. The electro-active device according to Claim 51, wherein plurality of domains are formed by decomposing a organometallic complex on a substrate and decomposing said organometallic complex at a temperature of less than about 200°C.

80. The electro-active device according to Claim 51, further comprising a second metal-containing layer disposed between said least one active layer and one of said first electrode and said second electrode.

81. A method of forming a metal-containing layer on a surface of a substrate, wherein the metal-containing layer comprises at least one metal disposed in a plurality of domains, the method comprising the steps of:

a) providing at least one organometallic complex of the at least one metal;

b) applying the at least one organometallic complex to the surface; and

c) decomposing the at least one organometallic complex on the surface at a temperature of less than about 200°C to form the plurality of domains of the at least one metal in elemental form.

82. The method according to Claim 82, wherein the step of providing at least one organometallic complex of the at least one metal comprises the steps of:

a) providing the at least one organometallic complex;

b) providing a solvent;

d) forming a solution of the at least one organometallic complex in the solvent; and

e) applying the solution to the surface.

83. The method according to Claim 82, wherein the solvent is an organic solvent.

84. The method according to Claim 83, wherein the solvent comprises at least one of xylene, toluene, benzene, tetrahydrofuran, methylene dichloride, an alkane, and combinations thereof.

85. The method according to Claim 82, wherein the solvent is substantially free of aromatic compounds.

86. The method according to Claim 85, wherein the solvent comprises at least one silicon vinyl containing siloxane oligomer.

87. The method according to Claim 82, wherein the solution is a solution comprising the at least one metal in a low valence state and vinyl siloxane ligands.

88. The method according to Claim 87, wherein the solution comprises (bis(divinyltetramethyldisiloxy)platinum1,5-cyclooctadiene.

89. The method according to Claim 82, wherein the solution comprises at least about 0.1 weight percent of the at least one metal.

90. The method according to Claim 89, wherein the solution comprises from about 0.1 weight percent to about 15 weight percent of the at least one metal.

91. The method according to Claim 89, wherein the solution is a saturated solution of the at least one metal.

92. The method according to Claim 81, wherein the at least one metal comprises a transition metal.

93. The method according to Claim 92, wherein the transition metal is one of platinum, palladium, gold, silver, ruthenium, osmium, iridium, rhodium, copper, nickel, aluminum, and combinations thereof.

94. The method according to Claim 93, wherein the transition metal is platinum.

95. The method according to Claim 81, wherein the step of applying the solution to the surface comprises at least one of spin coating the solution onto the surface of the substrate, printing the solution onto the substrate, bar coating the solution onto the substrate, spray coating the solution onto the substrate, dip coating

the solution onto the substrate, roller coating the solution onto the substrate, and blade coating the solution onto the substrate.

96. The method according to Claim 81, wherein the step of decomposing the at least one organometallic complex on the surface at a temperature below about 200°C comprises heating the at least one organometallic to a temperature in a range from about 20°C to about 200°C.

97. The method according to Claim 96, wherein the step of decomposing the at least one organometallic complex on the surface at a temperature in a range from about 20°C to about 200°C comprises heating the at least one organometallic compound to a temperature in a range from about 100°C to about 200°C.

98. The method according to Claim 97, wherein the step of decomposing the at least one organometallic complex on the surface at a temperature in a range from about 20°C to about 200°C comprises heating the at least one organometallic to a temperature in a range from about 120°C to about 180°C.

99. The method according to Claim 81, wherein the step of decomposing the at least one organometallic complex on the surface at a temperature below about 200°C comprises irradiating the at least one organometallic complex on the surface.

100. The method according to Claim 99, wherein the step of irradiating the at least one organometallic complex on the surface comprises irradiating the at least one organometallic complex on the surface with ultraviolet radiation.

101. The method according to Claim 81, wherein the step of applying the at least one organometallic complex to the surface comprises applying an amount of the at least one metal sufficient to form a coating that is electrically conductive and transparent to visible light.

102. The method according to Claim 81, wherein the substrate comprises an electrode of an electro-active device.

103. The method according to Claim 102, wherein the electro-active device is one of a photovoltaic cell and an organic light emitting diode.

104. The method according to Claim 81, wherein the at least one organometallic complex comprises at least one transition metal.

105. The method according to Claim 104, wherein the at least one transition metal is one of platinum, palladium, gold, silver, ruthenium, osmium, iridium, rhodium, copper, nickel, aluminum, and combinations thereof.

106. The method according to Claim 105, wherein the at least one transition metal is one of platinum, gold, and combinations thereof.

107. The method according to Claim 104, wherein the at least one transition metal is in the zero (0) oxidation state.

108. The method according to Claim 81, wherein the at least one organometallic complex is one of dimethyl(1,5-cyclooctadiene) platinum, (trimethyl)methylcyclopentadienyl platinum, and combinations thereof.

109. The method according to Claim 81, wherein the plurality of domains disposed within the metal-containing layer is discontinuous.

110. The method according to Claim 81, wherein the plurality of domains disposed form a continuous metal-containing layer.